

Application Serial No. 08/845,897
Applicant(s): Imam et al.

PATENT APPLICATION
Navy Case No. 77,897

In the Claims:

18. (Twice amended) The composite article of claim [17,] 1, wherein said metal foam has a gradation of pores sizes in at least one direction along the metal foam.

REMARKS

Status of the Claims

Claims 1-22 are pending in the application. No claims have been canceled. Claims 5, 6, 8-10, and 12-16 have been withdrawn from consideration by the examiner, as being directed to a non-elected species. No claims have been added by amendment hereby. Claims 1-4, 7, and 17-22 have been rejected. No claims have been allowed.

Status of Amendments

The specification has been amended to correct apparent editing errors. Support for "metal foam" may be found throughout the application including, *inter alia*, at the paragraph beginning on page 5, line 21 (describing methods for making metal foams), and at the paragraph beginning on page 6, line 12 (describing foams as characterized by pore size, defined as the number of pores per linear unit length, pores being synonymous with cells, specification at page 7, lines 11-12). Support for "superior to" is self-evident.

Claim 18 has been amended to change its dependency.

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Response to Examiner's Objections and Rejections

The Examiner has rejected claim 18 under 35 U.S.C. § 112, second paragraph, as indefinite. The Examiner urges that "[c]laim 18, which is dependent upon claim 17, contradicts claim 17". Applicants note that, as the specification teaches, there is no contradiction between claims 17 and 18, since, as the specification teaches:

If desired, the metal foam may be divided into regions of different pore size, or may have a gradation of pores sizes in any direction along the metal foam, while maintaining locally uniform pore size, without harming the predictability of performance.

Specification at page 7 lines 20-23. Nevertheless, in the interest in advancing prosecution, this rejection is deemed obviated by the foregoing amendment, making claim 18 dependent on claim 1 instead of claim 17.

The Examiner has rejected claims 1-4, 7, 19, and 22 under 35 U.S.C. § 102(b), as being anticipated by Fisher et al., U.S. Patent No. 5,222,561. The Examiner urges that "[t]he porous metal fiber structure of Fisher reads on the definition of an open cell foam provided by the applicant on page 16 [*sic*, 5], line 13 et seq[.] of the specification. Thus, Fisher anticipated the claimed subject matter." This rejection is respectfully traversed, for the reasons set forth below.

The specification at page 5 line 13 et seq. describes the metal foams of the present invention as "having an open cell structure that permits impregnation with an uncured polymer." Accordingly, an open cell structure has always been part of applicants' definition of an open-cell metal foam. This definition, of course, comports with the conventional definition of an open-cell metal foam. See the

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previously-submitted page 566 of the Encyclopedia of Polymer Science and Engineering, Vol. 3, John Wiley & Sons, Inc., New York (1985), stating that an open-cell foam is a foam having "a large fraction of open cells".

In contrast, the metal component of the composite article taught by Fisher is a "kinked metal wire" (Abstract). This kinked metal wire does not form open cells, closed cells, or cells of any type.

The amendment to the specification further clarifies that the metal foam of the present invention may be any metal foam, regardless of shape or percent density, having an open cell structure that permits impregnation with an uncured polymer. But even without this amendment, the specification describes the foam as having a "cell structure" that the consolidated kinked wires of Fisher lack.

The Examiner has rejected claims 1-4, 7, 11, 19, and 22 under 35 U.S.C. § 102(b), as being anticipated by Tsang et al., U.S. Patent No. 4,605,595. The Examiner urges that Tsang "discloses that suitable binders include epoxy resins and phenolic resins" and therefore "anticipated the claimed subject matter." This rejection is respectfully traversed, for the reasons set forth below.

The claimed invention requires that the open cell foam is "impregnated with said polymeric matrix so as to completely penetrate said open cell structure of said foam and fill the cells thereof."

Tsang et al. teaches away from this requirement, by teaching the use of fillers, reinforcing materials, etc. in the epoxy. To the extent that the epoxy taught by Tsang et al. contains fillers, reinforcing materials, etc., it cannot "fill the cells" since some of the volume within the cells will be occupied by the fillers and reinforcing materials rather than the polymer.

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The Examiner has rejected claims 1-4, 7, 19, and 22 under 35 U.S.C. § 102(b), as being anticipated by Reitz, U.S. Patent No. 4,759,000. The Examiner urges that "Reitz discloses the claimed invention expect [*sic*] for literally disclosing that the metal foam is an open celled foam" but that "it appears that the foam must inherently be an open cell foam because the pores of the foam are filled with the impregnate" (column 9, line 67 to column 10, line 11). This rejection is respectfully traversed, for the reasons set forth below.

The structure taught by Reitz et al. is "a porous metal foam such as aluminum-nickel impregnated with rubber." Column 9 lines 67-69. In contrast to the elastomer impregnate taught by Reitz, the claimed invention requires "a non-elastomeric polymeric matrix" (claim 1).

Moreover, Reitz et al. clearly teaches away from the present invention, describing the cited structure as "an acoustic window . . . not . . . an acoustically absorptive material". Column 10 lines 3-4. Reitz et al. teaches that acoustic absorption instead is produced by an entirely different structure: strands of wire immersed in a viscous fluid, mechanically coupled to a resonating mass (see, e.g., abstract).

The Examiner has rejected claims 17, 18, 20, and 21 under 35 U.S.C. § 103(a), as being obvious from any of Fisher, Tsang, or Reitz. For the reasons set forth above, incorporated by reference herein, this basis of rejection is likewise respectfully traversed.


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For the foregoing reasons, the application is considered to be in condition for allowance.
Applicants respectfully request favorable reconsideration. Kindly charge any additional fees due, or
credit overpayment of fees, to Deposit Account No. 50-0281.

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Respectfully submitted,


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